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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/845,654	04/30/2001	Todd P. Lukanc	39153/371 (F0812)	2723

7590

09/19/2002

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EXAMINER

MALDONADO, JULIO J

ART UNIT

PAPER NUMBER

2823

DATE MAILED: 09/19/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/845,654

Applicant(s)

LUKANC ET AL.

Examiner

Julio J. Maldonado

Art Unit

2823

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 July 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

1. The non-final rejection as set forth in paper No. 2 is withdrawn in response to applicants' amendments.
2. A new 103(a) rejection is made as set forth in this Office Action.
3. Claims 1-20 are pending in the application.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or
(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

5. Claims 7, 8, 11, 13-15 and 17 are rejected under 35 U.S.C. 102(e) as being anticipated by Tang et al. (U.S. 6,156,485).

Tang et al. (Figs.4A-4D) in a method of high aspect ratio etching teach the steps of providing a reflective metal layer (230) over a gate material layer (220), wherein said reflective metal layer (230) comprises tungsten and is selected based on the etch chemistry of the reflective metal layer (230) and the gate material layer (220); providing a mask layer (150, 230) over the reflective metal layer (230), wherein said mask layer (150, 230) comprises a layer of anti-reflective coating (ARC) (230) and a layer of resist (150); and patterning the gate material layer (220) including selectively etching the

mask layer (240) and the reflective metal layer (230), wherein said ARC layer (230) comprises silicon oxynitride (SiON) (column 7, line 16 – column 8, line 3).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-6, 9, 10, 16 and 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tang et al. ('485) in view of McKee (U.S. 5,804,088).

In reference to claims 1-4, 6, 9, 12, 18 and 19, Tang et al. (Figs.4A-4D) in a related method of high aspect ratio etching teach the steps of depositing a reflective metal layer (230) over a gate material layer (220), wherein said reflective metal layer (230) comprises tungsten; depositing a mask layer (150, 230) over the reflective metal layer (230), wherein said mask layer (150, 230) comprises a layer of anti-reflective coating (ARC) (230) and a layer of resist (150); removing portions of the anti-reflective coating (230) to form a pattern; etching the reflective metal layer (230) using the pattern formed from the removed portions of the anti-reflective coating (230); and removing portions of the gate material layer (220) using the pattern from the removed portions of the anti-reflective coating (230), wherein said ARC layer (230) comprises silicon oxynitride (SiON) (column 7, line 16 – column 8, line 3).

Tang et al. fail to teach the steps of providing a gate material layer comprising polysilicon and trim etching the anti-reflective coating to form a pattern, wherein said

trim etching comprises isotropic etching. However, McKee (Figs.8a-83) in a related method to form gate structures teaches the steps of providing a gate material layer (806) comprising polysilicon; depositing an anti-reflective coating (821); and trim etching the anti-reflective coating (821) to form a pattern, wherein said trim etching comprises isotropic etching (column 5, line 23 – column 6, line 15). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to form a polysilicon gate material layer as taught by McKee in the high aspect ratio etching process of Tang et al., since polysilicon is a well-known material and its selection involves common knowledge in the art (column 1, lines 12-56). Also it would also have been obvious to one of ordinary skill in the art at the time of the invention was made to trim etch the anti-reflective coating as taught by McKee in the high aspect ratio etching process of Tang et al., since this would reduce the line width of the gate structure (column 1, lines 59-63).

In reference to claims 5, 10, 12, 16 and 20, the combined teachings of Tang et al. and McKee teach that the reflective material layer is optically opaque to the gate material layer with a thickness of about 500 to 3,000 angstroms (Tang et al., column 7, lines 16-34). The combination of Tang et al. and McKee fail to teach depositing said reflective material layer with a thickness of about 80-200 angstroms. However, This claim is prima facie obvious without showing that the claimed ranges achieve unexpected results relative to the prior art range. In re Woodruff, 16 USPQ2d 1935, 1937 (Fed. Cir. 1990). See also In re Huang, 40 USPQ2d 1685, 1688(Fed. Cir. 1996)(claimed ranges of a result effective variable, which do not overlap the prior art

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ranges, are unpatentable unless they produce a new and unexpected result which is different in kind and not merely in degree from the results of the prior art). See also *In re Boesch*, 205 USPQ 215 (CCPA) (discovery of optimum value of result effective variable in known process is ordinarily within skill of art) and *In re Aller*, 105 USPQ 233 (CCPA 1955) (selection of optimum ranges within prior art general conditions is obvious).

Conclusion

8. Papers related to this application may be submitted directly to Art Unit 2823 by facsimile transmission. Papers should be faxed to Art Unit 2823 via the Art Unit 2823 Fax Center located in Crystal Plaza 4, room 3C23. The faxing of such papers must conform to the notice published in the Official Gazette, 1096 OG 30 (15 November 1989). The Art Unit 2823 Fax Center number is **(703) 305-3432**. The Art Unit 2823 Fax Center is to be used only for papers related to Art Unit 2823 applications.

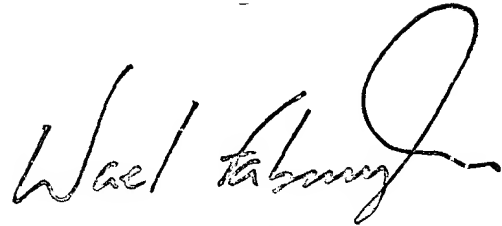
Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Julio J. Maldonado** at **(703) 306-0098** and between the hours of 8:00 AM to 4:00 PM (Eastern Standard Time) Monday through Friday or by e-mail via julio.maldonado@uspto.gov. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy, can be reached on (703) 308-4918.

Any inquiry of a general nature or relating to the status of this application should be directed to the **Group 2800 Receptionist** at **(703) 308-0956**.

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A handwritten signature in black ink, appearing to read "Wael Labadie". The signature is fluid and cursive, with a large loop at the end.

SUPERVISORY PRIMARY EXAMINER
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